

1     ABSTRACT OF THE DISCLOSURE

2             A capacitor fabrication method may include atomic layer depositing  
3     a conductive barrier layer to oxygen diffusion over the first electrode.  
4     A method may instead include chemisorbing a layer of a first precursor  
5     at least one monolayer thick over the first electrode and chemisorbing  
6     a layer of a second precursor at least one monolayer thick on the first  
7     precursor layer, a chemisorption product of the first and second  
8     precursor layers being comprised by a layer of a conductive barrier  
9     material. The barrier layer may be sufficiently thick and dense to  
10    reduce oxidation of the first electrode by oxygen diffusion from over the  
11    barrier layer. An alternative method may include forming a first  
12    capacitor electrode over a substrate, the first electrode having an inner  
13    surface area per unit area and an outer surface area per unit area that  
14    are both greater than an outer surface area per unit area of the  
15    substrate. A capacitor dielectric layer and a second capacitor electrode  
16    may be formed over the dielectric layer. The method may further  
17    include forming rugged polysilicon over the substrate, the first electrode  
18    being over the rugged polysilicon. Accordingly, the outer surface area  
19    of the first electrode can be at least 30% greater than the outer surface  
20    area of the substrate without the first electrode including polysilicon.